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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/724,616	12/02/2003	Gyu Ha Choe	P24344	2603

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EXAMINER	
HALL, ASHA J	

ART UNIT	PAPER NUMBER
1795	

NOTIFICATION DATE	DELIVERY MODE
10/11/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/724,616	CHOE, GYU HA	
	Examiner	Art Unit	
	Asha Hall	1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 July 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *July 20, 2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *July 20, 2007*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings were received on July 20, 2007. These drawings are acceptable.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Han et al. (KR20030013661) in view of Tatsuyuki et al. (JP2003005849).

In regard to claim 1, Han et al. discloses a system for implementing a virtual solar cell, comprising:

(a) a data detector/data communication part (p.4, paragraph 4) including a insolation sensor and adapted to collect external environment data/information from the outside (p.4, paragraph 6);

(b) a controller configured to receive real-time data (p.3, paragraph 16) from one of the data detector and a user based on an operating mode to classify (p.3, paragraph 17), the received data in a predetermined format/serial communication method using RS232C or RS485 (p.4, paragraph 6) to transmit the classified data to a data logger /information storage device (p.4, paragraph 6);

(c) to generate a voltage-current model having the same effect as that

of an actual solar cell on the basis of the received data (p.4, paragraph 18);

(d) to generate a pulse width modulation signal for controlling the operation of the power converter according to the voltage-current model (p.4, paragraph 17);

wherein

(e) the power converter is adapted to convert input power (p.4, paragraph 16) in response to the pulse width modulation signal (p.4, paragraph 17) to provide power to a load (p.3, paragraph 8);

(f) the data logger/information storage device (p.4, paragraph 6) is adapted to communicate with the controller (p.3, paragraph 16) or the data detector/data communication part (p.4, paragraph 4) and to store in the (p.4, paragraph 6) data/information storage device (p.4, paragraph 6) received from the controller or the data detector.

Han et al. discloses the elements of claim 1 as discussed above, but fails to disclose a virtual solar cell. Tatsuyuki discloses a system for implementing data (paragraph 4) and further describes a solar battery simulator, wherein it carries out a simulation of the amount of electrical energy a solar-module installed corresponding to a surrounding environment (paragraph 10). Thus, it would have been obvious to one skill in the art at the time of the invention to include a virtual/simulated solar cell module described in Tatsuyuki et al. in the system of Han et al. in order to collect corresponding properties of solar cell module to the external environmental data.

With respect to claim 2, modified Han et al. discloses system of claim 1 as discussed above, but fails to describe the data detector that further includes a unit cell solar battery. Tatsuyuki et al. discloses a system for implementing data (paragraph 4) and describes the use of a solar battery database with which the exact amount of electrical energy of a solar cell module is obtained (paragraph 9). Tatsuyuki et al. further teaches that the purpose of extracting the properties of each module is to use it in the calculation of the output electrical energy corresponding to an external environmental data (paragraph 10). Hence, it would have been obvious to one skill in the art at the time of the invention to include a solar battery database described in Tatsuyuki et al. in the system of Han et al. in order to collect correlative corresponding properties of solar battery/solar cell module to the external environmental data.

With respect to claim 3, Han et al. discloses system of claim 1 as discussed above, and but fails to further disclose a data detector comprises of a temperature sensor. Tatsuyuki et al. discloses a system for implementing data (paragraph 4) and describes the data detector, which includes at least one of ambient temperature sensor, insolation sensor or wind velocity sensor (paragraph 10-11). Tatsuyuki et al. characterizes the solar cell energy generator by the ambient temperature, insolation sensor, or wind velocity. It would have been obvious to one skill in the art at the time of the invention to incorporate the measurement sensor described in Tatsuyuki to the system of Han et al. to adequately characterize solar cell modules.

In regard to claim 4, Han et al. discloses system of claim 1, and further describes the data logger/information storage device (p.4, paragraph 6). However, Han fails to

disclose to a classification by at least one of a time, a place, and a manufacturer. Tatsuyuki et al. discloses a system for implementing data (paragraph 4) and discloses the data-logging unit (paragraph 50-51) classifies data by time, place, and solar cell manufacturers to store the data (paragraph 58). He describes this as a method of acquiring information on a functional basis that would be effectively simulates solar power generation (paragraph 54). Thus, it would have been obvious to one skill in the art at the time of the invention to apply the data-logging unit of Tatsuyuki et al. to the system of Han et al. that classifies data by time, location and manufacturer to adequately characterize the solar cell.

With respect to claim 5, Han et al. discloses the system as disclosed in claim 1, wherein the controller/direct-current voltage regulator (p.3, paragraph 1) to generate the voltage-current (p.3, paragraph 1) on the basis of the real-time data/operating conditions (p.3, paragraph 16) received from the data detector/data communication part (p.4, paragraph 4) or from previously stored data/database (p.3, paragraph 17) received from the data logger/information storage device (p.4, paragraph 6).

With respect to claim 6, a method for implementing a virtual solar cell, comprising:

(a) allowing a controller (p.3, paragraph 16) to receive external environmental data from one of a data detector and a user interface/memory device based on an operating mode (p.4, paragraph 5& 6);

(b) classifying the received data in a predetermined format or stores it (p.4, paragraph 6);

(c) generating a voltage-current model for obtaining an output characteristic of an actual solar cell on the basis of the received data result of the current control (p.4, paragraph 18) and generating a pulse width modulation signal according to a result of the performed current control (p.4, paragraph 17); and

(d) controlling a power converter (p.4, paragraph 16) in response to the pulse width modulation signal (p.4, paragraph 17).

Han et al. discloses the elements of claim 6 as discussed above, however they fail to disclose a virtual solar cell. Tatsuyuki et al. discloses a system for implementing data (paragraph 4) and describes a solar battery simulator, wherein it carries out a simulation of the amount of electrical energy a solar-module installed corresponding to a surrounding environment (paragraph 10). Thus, it would have been obvious to one skill in the art at the time of the invention to virtual/simulated solar cell module described in Tatsuyuki et al. in the system of Han et al. in order to collect corresponding properties of solar cell module to the external environmental data.

In regard to claim 7, Han et al. discloses method of claim 6 as discussed above, but fails to disclose to temperature, insolation, and output characteristic data. Tatsuyuki et al. discloses a system for implementing the received data (paragraph 4) and describes a database, wherein the external environmental data includes at least one of ambient temperature, insolation/solar radiation energy, and characterization (paragraph 12). Tatsuyuki et al. characterizes by the ambient temperature and insolation/solar radiation energy of the solar cell modules (paragraph 13). It would have been obvious to one skill in the art at the time of the invention to implement a controller that receives

temperature, insolation and output characteristic data as described in Tatsuyuki to the system of Han et al. to adequately characterize solar cell modules.

With respect to claim 8, Han et al. discloses the elements of claim 6 as described above, but fails to disclose classifying, comprises classifying the received data by a time, a place, and a manufacturer. Tatsuyuki et al. discloses a system for implementing data (paragraph 4) and discloses the data-logging unit classifies data (paragraph 50-51) by time, place and solar cell manufacturers and the method to store the data storing the data in a database (paragraph 12 and 58). He describes this a method of acquiring information on a functional basis that would be effectively execute the objective of his invention (paragraph 54). Thus, it would have been obvious to one skill in the art at the time of the invention to apply the data-logging unit of Tatsuyuki et al. to the system of Han et al. that classifies data by time, location and manufacturer to adequately characterize the solar cell.

In regard to claim 9, Han et al. discloses the method as claimed in claim 6 as discussed above, wherein the step of generating a voltage-current model comprises generating the voltage -current (p.3, paragraph 1) on the basis of one of a real-time data/operating conditions (p.4, paragraph 2) received from the data detector/ data communication part (p.4, paragraph 3).

With regard to claim 10, Han et al. discloses the method of claim 9 above, but fails to disclose wherein the arbitrary data inputted by the user comprises inputting data using the a user interface screen. Tatsuyuki et al. also discloses the system for implementing data through simulations (paragraph 4) and discloses the predetermined

method of into inputting data through a program inside the computer system/equipment that executes this program (paragraph 53-54). Thus, it would have been obvious to one skill in the art at the time of the invention to combine the method of utilizing a computer to input data described by Tatsuyuki et al. to modify the system for implementing data of Han et al. in order to utilize a computer to execute the program.

In regard to claim 11, Han et al. discloses the system as applied to claim 1 above, wherein the controller/control system (p.3; paragraph 7) is further configured to generate the voltage-current model (p.3; paragraph 1) on the basis of one of a real-time data (p.4, paragraph 2) received from the data detector/ data communication part (p.4, paragraph 3).

With respect to claims 12-14, Han et al. discloses the system according to claim 11, and further discloses a short-circuit current and wherein the short-circuit current corresponds to a maximum point data of electric insulation simulation (p.4; paragraph 15 & 16). However, Han et al. fails to disclose the arbitrary data and real-time data inputted by a user comprises at least one of a temperature data, insolation data, a voltage data, a current data, and open voltage data.

Tatsuyuki et al. discloses a system for implementing the received data (paragraph 4) and describes a database, wherein the external environmental data includes at least one of ambient temperature, insolation/solar radiation energy, and characterization (paragraph 12) inputted by a user (paragraph 24). Tatsuyuki et al. characterizes by the ambient temperature and insolation/solar radiation energy of the solar cell modules (paragraph 13). It would have been obvious to one skill in the art at the time of the invention to implement a controller that receives temperature, insolation

and output characteristic data as described in Tatsuyuki to the system of Han et al. to adequately characterize solar cell modules.

1. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tatsuyuki et al. (JP2003005849) in view of Han et al. (KR20030013661).

With respect to claim 15, Tatsuyuki et al. discloses a method for implementing a virtual solar cell/solar cell power simulator (paragraph 4) in one of two modes, a first mode (paragraph 12) including implementing the virtual solar cell on a basis of at least one of an actually determined temperature, insolation and manufacturer, a second mode (paragraph 12) including implementing the virtual solar cell on a basis of adding the amount of a temperature data (paragraph 25) input in real-time by a user (paragraph 24), the method comprising: receiving environmental data from one of a data detector (paragraph 10) and a user interface/computer system/equipment at executes this program (paragraph 53-54); generating a voltage-current model for obtaining an output characteristic of an actual solar cell on the basis of the received data (paragraph 19). However, Tatsuyuki et al. fails to disclose classifying the received data in a predetermined format; performing a current control according to the generated voltage-current model; generating a pulse width modulation signal according to a result of the performed current control; and controlling a power converter in response to the pulse width modulation signal.

Han discloses generating a voltage-current model/simulation for obtaining an output characteristic of a energy conversion cell on the basis of the received data (p.2, paragraph 1 and p.4, paragraph 18) and further discloses classifying the received data

in a predetermined format/serial communication method using RS232C or RS485 (p.4, paragraph 6); and controlling a power converter (p.4, paragraph 16) in response to the pulse width modulation signal (p.4, paragraph 17); generating a voltage-current model for obtaining an output characteristic of an actual solar cell on the basis of the received data result of the current control (p.4, paragraph 18) and generating a pulse width modulation signal according to a result of the performed current control (p.4, paragraph 17). Han further teaches that the simulator can virtually realize the dynamic and static characteristics of a fuel cell (which address the same issues of a solar cell system), which can be exerted in the same state as the operation conditions of a cell system being actually operated at a real time without a fuel cell. Moreover, Han discloses that the virtual fuel cell has a power system so that the entire performance test of the fuel cell system can be carried out without directly using a expensive fuel cell and can be utilized in the development of peripheral devices required before the fuel cell system (p.2, paragraph 1). It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the power system as taught by Han to the virtual solar cell power system simulator of Tatsuyuki et al. in order to test of the cell system can be carried out without directly using a expensive cell and can be utilized in the development of peripheral devices required before the cell system.

Response to Arguments

Claim Rejection under 35 USC §112

2. Due to Applicant's amendments the 35 USC §112 rejections for claims 1 and 10 are withdrawn.

Claim Rejection under 35 USC §103

3. All arguments are directed toward the claims 1 and 6 and all dependants as currently amended. Such amendments require new grounds of rejection as presented above.

In regard to claims 1-10, HAN does not disclose or suggest a virtual solar cell or a controller as is recited in, for example, claim 1, much less receiving real-time data from one of a data detector and a user based on an operating mode. The Examiner respectfully disagrees. In response to applicant's argument that "Han does not disclose or suggest a virtual solar cell" is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Han is reasonably pertinent to the particular problem with which the applicant was concerned. According to the applicant's disclosure, "the present invention relates to a solar power generation system and, more particularly, to a system and method for implementing a virtual solar cell to obtain the same output power characteristic as that of a solar cell located in the place a user wants at the time when the user desires even without installing an actual solar cell array in the spot" (page 1). Han discloses that "The present invention pertains to a fuel cell simulator that can virtually realize the dynamic and static characteristics of a fuel cell, which can be exerted in the same state as the operation conditions of a fuel cell system being actually operated, at real time without a fuel cell.

More specifically, the present invention pertains to a real-time fuel cell simulator that is equipped with a power system, which consists of an energy supplier for supplying an electric energy and a power converter for receiving a fixed direct-current power from the energy supplier and regulates the voltage and current and converts the electric energy, and an information processing and control system capable of controlling the electric output of this power system in a desired shape, so that the entire performance test of the fuel cell system can be carried out without directly using an expensive fuel cell and can be utilized in the development of peripheral devices required for the fuel cell system" (page 2, paragraph 1).

In regard to claims 1 and 6, the Applicants argues that TATSUYUKI does not teach or suggest that which HAN is lacking, i.e., at least receiving real-time data from one of a data detector and a user based on an operating mode, as recited, e.g., in independent claims 1 or 6. The Examiner respectfully disagrees. Han et al. discloses the elements of claim 1 as discussed above, but fails to disclose a virtual solar cell. Tatsuyuki discloses a system for implementing data (paragraph 4) and further describes a solar battery simulator, wherein it carries out a simulation of the amount of electrical energy a solar-module installed corresponding to a surrounding environment (paragraph 10). Thus, it would have been obvious to one skill in the art at the time of the invention to include a virtual/simulated solar cell module described in Tatsuyuki et al. in the system of Han et al. in order to collect corresponding properties of solar cell module to the external environmental data.

Applicant's arguments filed July 20, 2007 have been fully considered but they are not persuasive. The Applicants argues that one of ordinary skill in the art would not have been motivated to combine HAN with TATSUYUKI, as posited in the Official Action. The Examiner respectfully disagrees. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Han teaches the advantages of implementing a virtual fuel cell (page 2, paragraph 1) and Tatsuyuki teaches a solar battery characteristic simulator which carries out the simulation of the amount of generation of electrical energy of a solar cell (paragraph 1). The applicant' s invention encompasses the teachings and motivation of both Han and Tatsuyuki.

Conclusion

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Asha Hall whose telephone number is 571-272-9812. The examiner can normally be reached on Monday-Friday 7:30-5:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on 571-272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AJH

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SUPERVISORY PATENT EXAMINER